Pocket Power! - increasing the potential of anaerobic digestion at farm-scale

Tine Vergote[1,2,3], Anke De Dobbelaere[4], Bart Ryckaert[4], Jeroen Buysse[1], Eveline Volcke[2], Erik Meers[3]

[1]Department of Agricultural Economics, Faculty of Bioscience Engineering, Ghent, Belgium, Tine.Vergote@UGent.be
[2]Department of Biosystems Engineering, Faculty of Bioscience Engineering, Ghent, Belgium
[3]Department of Analytical and Applied Ecochemistry, Faculty of Bioscience Engineering, Ghent, Belgium
[4] Inagro vzw, Research and Advice Centre for Agriculture and Horticulture, www.inagro.be

Introduction

- Rising energy prices are becoming a more and more determining cost for agricultural companies
- Pocket digestion may lead to the (partial) fulfillment of the farm's energy requirements
- Limited scale: less transport costs, independence of market prices, less landscape disruption,…

Objectives

- Extending the positive experiences with pocket digestion of cattle slurry to **other agricultural streams** like pig manure and crop residues
- Quantify the amount of **greenhouse gas emission** that could be reduced by pocket digestion to be able to consider it as a climate measure

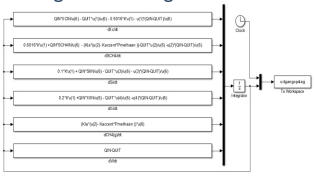
Work packages (WP) – Methods

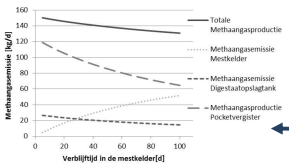
WP1: Coordination

WP2: Quantification of greenhouse gas emissions and optimization of process performance

Mechanistic model
- Manure storage
- Digester
- Digestate storage tank

Model simulations
- Retention time
- Reactor volume
- Temperature

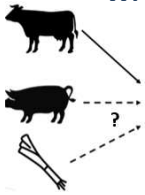




Full scale measuring campaign
Pocket digestion plant

MILESTONE: Customized strategies for pocket digestion with maximized biogas production and minimized greenhouse gas emissions

WP3: Sector scan – Extension possible?



- Biomass potential
- Technical feasibility
- Legal restrictions
- Economic impact
- Ecological impact

Total evaluation
Weights

Selecting two subsectors

MILESTONE: A priority list of companies within several subsectors for which pocket digestion proves to be feasible

WP4: Problem solver – Hands-on solutions

- Biomass (storage, processing)
- Digestion (technical aspects)
- Valorization (heat, digestate)

WP5: Design adjusted pocket digestion concept

Evaluation
- Ecological: Life Cycle Assessment
- Economical: Cost-benefit analysis

Selecting one subsector

WP6: First-of-a-kind and transferability

- Assistance in implementation of a pilot installation
- Solutions transferable to other sectors?

WP7: Distribution of results - Communication

Discussion

- Unused biomass: incentive to explore valorization options
- Convince farmers to invest in a pocket digester that contributes to the reduction of greenhouse gas emissions
- Many challenges to achieve an optimized practical implementation
  - Technical and legal issues
  - Profitability for farmer and constructor
  - Quantifying and optimizing environmental impact

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